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Emmy Noether (1882-1935), the Noether School and the Change of Mathematical Thinking: About “modernization” and “algebraization”.

My methods are really methods of working and of thinking; this is why they have crept in everywhere anonymously. (Noether 1931)¹

Approaching a scholar biographically – making the individual the focal point – allows for the tracing of an arc across academic developments, personal shaping possibilities, disciplinary interventions, and political change. In my presentation, Emmy Noether’s area of expertise – algebra –, her middle-class Jewish upbringing, her situation as a female scholar, and the changes to Germany’s academic structures following the Nazis’ seizure of power in 1933 all intersect. This captures my methodological approach at the interface of the history of mathematics, theory of science, and gender studies.

Emmy Noether and the school she formed have contributed substantively to the introduction of new approaches and methodological concepts under the heading of “modern algebra”.² Modern algebra here should be understood both as a mathematical discipline and as a holistic perspective on mathematics. Emmy Noether stands for these “methods of working and of thinking” developed in the 1920s and 1930s, which have often been called “abstract” or “axiomatic” and were met with skepticism by contemporaries.

There were never any doubts about Noether's mathematical expertise, yet her biography is one of professional discrimination, marginalization within her discipline, and late fame. How, under these circumstances, did Noether succeed in forming a

¹ Noether, Emmy to Hasse, Helmut (Letter 12.11.1931): Niedersächsische Staats- und Universitätsbibliothek Georg-August-Universität Göttingen, Abteilung Handschriften, Cod. Ms Hasse

² Koreuber, Mechthild (2015): *Emmy Noether, die Noether-Schule und die moderne Algebra. Zur Geschichte einer kulturellen Bewegung*. Springer, Berlin, Heidelberg.

school and effectually change mathematical ways of thinking? I will give a summary of Emmy Noether's biography, an introduction to her way of thinking, and a short overview of the Noether School in its personal, spatial, and temporal dimensions. Concluding remarks show the breadth of the influence of the Noether School in changing the mathematical way of thinking, which can be captured by the words "modernization" and "algebraization".

Short Bio

Dr. Mechthild Koreuber studied mathematics, history, philosophy and political science at Freie Universität Berlin and graduated in 1990 with a thesis in mathematics. She worked as research assistant at the department of computer science at Technische Universität Berlin. Since 1999, she has been Freie Universität Berlin's chief gender equality officer. In 2000, she was a founding member of the Association of Women's and Gender Research Institutions at Berlin Universities. As a member of the initiative group for the establishment of the Center for Gender Research in Medicine at Charité University Medicine Berlin, she received the Margherita von Brentano Prize in 2007. In 2011, she was elected to the executive committee of the Federal Conference of Gender Equality Officers at German Higher Education Institutions, a position she holds since this election. Since 2014, she has been a member of the Interdisciplinary Centre for Gender Studies at Freie Universität Berlin, Margherita-von-Brentano-Center. Mechthild Koreuber received her doctorate from Technische Universität Braunschweig with a work on "Emmy Noether, the Noether-School and modern Algebra: On the History of a cultural Movement " in 2014.